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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/765,388

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Nobuo Shimazu

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02/13/2003

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EXAMINER

VANORE, DAVID A

ART UNIT

PAPER NUMBER

2881

DATE MAILED: 02/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/765,388

Applicant(s)

SHIMAZU ET AL.

Examiner

David A Vanore

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 January 2001 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3 and 6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "satisfactorily" in claims 3 and 6 line 3 is a relative term which renders the claim indefinite. The term "satisfactorily" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Using the term "satisfactorily" to define the dimension of a beam in a charged particle lithography device because the terms meaning is subjective in nature. What is satisfactory in the context of the present invention? Is there a range of beam dimensions associated with what the applicant regards as satisfactory?

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, and 5 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Stengl et al.

Art Unit: 2881

Stengl et al. teaches an electron beam exposure apparatus and associated method of use comprising an electron source (Q and Col. 2 Lines 53-57), an electron beam shaping means comprising an electrostatic cylindrical lens (Elsbn1 through Elsubn in Fig. 2 and Col. 2 Lines 31-36) as recited in claim 2, a mask having a plurality of apertures (M) in proximity to a sample, a deflecting and scanning means (Fig. 4 and Fig. 5 Item MP Col. 8 Lines 54-Col. 9 Line 9), a stage (S), where the beam is shaped to have a cross section in the plane of the sample which is smaller than the cross section in a plane extending vertically and perpendicular from the sample (Col. 8 Lines 54-Col. 9 Line 9) as recited in claims 1, 2, and 5.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 4, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stengl et al. in view of Muraki et al.

Stengl et al. teaches all limitations as applied above but fails to explicitly teach an electron beam lithography device having an interval in between adjacent scan lines in an exposure process, and each portion of a pattern is exposed by scanning an electron beam at least five times as recited in claims 3, 4, and 6.

Muraki et al. teaches an electron beam lithography device where each exposure region in a scan line has an interval between a subsequent scan line (Fig. 6B). Muraki

Art Unit: 2881

et al. also teaches a device where each element which comprises a pattern is scanned any number of required times to effect total pattern exposure. Regarding claim 4, given that there are more pattern elements in the example of Fig. 6B, Muraki et al. clearly teaches that a total pattern is produced in more than five exposures because there are clearly more than five pattern elements. (Col. 15 Lines 10-25)

Muraki et al. modifies the device and method of Stengl et al. to produce a device which exposes a pattern having a plurality of pattern elements with an interval between them, the exposure of the pattern being carried out by exposing a substrate to a plurality of scans on the surface of a substrate by an electron beam.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an interval between scanning regions or pattern elements on a substrate for exposure in a multiple pass electron beam lithography device because, not only are these limitations taught by Muraki et al., but the configuration of pattern elements to be exposed and the amount of scans required by an electron beam are a function of the pattern, chosen by the practitioner of the invention. For example, one could select a pattern having any amount of desired space within a given pattern for exposure, such as in a SEM metrology standard where a plurality of raised lines are scribed into a substrate with differing distances between said lines. Secondly, the exposing of a pattern multiple times could be a function of reducing proximity effect, the depth and complexity of the pattern to be exposed, or the size and number of partitions in a total pattern selected to be exposed. The recited limitations are taught by Muraki et al. as cited above.

Art Unit: 2881

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following US Patents teach lithography devices and methods relating to the present invention:

US Patent 5,874,739 (Bushbeck et al.); US Patent 5,391,886 (Yamada et al);

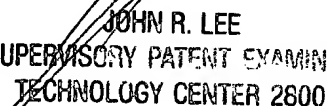
US Patent 5,770,862 (Ooaeh et al.); and US Patent 4,963,748 (Szilagyi);

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A Vanore whose telephone number is 703-306-0246. The examiner can normally be reached on M-F 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Lee can be reached on 703-308-4116. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

dav
January 29, 2003


JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600